Carleton

STAT 120: Introduction to Statistics

Fall 2025

MEETINGS:	MWF 5a CMC 102	1:50-3:00 MW; 2:20-3:20 F	
PROFESSOR:	Amanda Luby Office Hours:	aluby@carleton.edu Mon 12:30-1:30pm Tues 2-3pm Wed 3-4pm (Stat120 priority) Fri 10-11am (Stat340 priority) By appt through my Google Calendar	CMC 223 CMC 307
WEBSITE:	moodle.carleton.edu/		
TEXTS:	*Statistics: Unlocking the Power of Data* (3rd edition) by Lock, Lock, Lock, Lock, & Lock (yes there's 5 of them) *Stat120 Lab Manual :* math.carleton.edu/RLabManual/ by Laura Chihara and Adam Loy		
SOFTWARE:	Maize RStudio Server to access R through your browser: maize.mathcs.carleton.edu R (optional) , free download from r-project.org/ RStudio (optional), free from rstudio.com/downloads		

COURSE DESCRIPTION

Stat120 serves as an introduction to statistics and data analysis. Practical aspects of statistics will be emphasized, including extensive use of programming in the statistical software R, interpretation and communication of results. Topics include: exploratory data analysis, correlation and linear regression, design of experiments, the normal distribution, randomization approach to inference, sampling distributions, estimation, and hypothesis testing.

COURSE OBJECTIVES

Statistical literacy is a key skill for many different courses and majors, and necessary to be a responsible citizen in the "real world". In this course, we will lay the foundations for statistical literacy and learn basic data analysis skills. Upon successful completion of the course, students are expected to be able to:

- Work with and describe various types of data
- Understand the role of variation and randomness and the principles of statistical inference
- Choose the appropriate statistical analysis for a given task and recognize when certain statistical analyses are *not* appropriate
- Analyze data and apply statistical methods using R and interpret results
- Critically examine analyses of data and interpretations of results from statistical methods

There are no prerequisites for this course, and you do not need to have *any* background in statistics, mathematics, or computer science to do well in this course.

If you've already taken Math 211, Psych 200, Psych 201, SOAN 239 or Stat 250, a different statistics class may be more appropriate for you. Please reach out if this is the case.

COURSE COMPONENTS

COURSE MEETINGS: There will be three course meetings per week (Mondays, Wednesdays, and Fridays). Daily attendance is expected. Course meetings will combine demonstrations using R, theoretical background, and in-class group exercises. On most days, I'll ask you to complete a reading or watch a short video before class, as well as complete a "daily check in" on gradescope before class. Late completions will not be accepted, but I will drop your lowest 3 when computing your final grade.

ASSIGNMENTS: Homework will be assigned once per week (typically due Wednesdays or Fridays) and should be submitted on gradescope by 10pm — this is the time that Stat Lab Sessions end on weekdays. There is a 12-hour grace period for each assignment. If you are ill or have an emergency, please contact me to arrange an alternative due date. Assignment

submissions should be neatly written and scanned or submitted as a PDF file. You must show all work to receive credit.

MIDTERM EXAMS: A key part of statistical literacy is being able to recall concepts "on the fly". I use in-class exams to assess your understanding of class material without access to resources. There will be three midterm exams — tentatively scheduled for **Fridays of Week 3, 6, and 9.**

FINAL PROJECT: The final project will be a group data analysis project and consist of a poster session on the last day of class and short paper due during finals period. A proposal is due before the midterm break and will make up a portion of your grade.

COMMUNICATION: Assignments, note sets, and grades will be posted on Moodle. We will also use Slack for announcements, discussion, and homework questions. Please use Slack for any homework or course content questions; email me privately with any personal matters (grade discussions, illness, emergency, etc.). Any time-sensitive announcements will be posted on Slack and Moodle. It is your responsibility to make sure that your notification settings allow time-sensitive announcements to reach you.

GRADING POLICIES

Grades are an imperfect measure of learning. This course is designed to reward you for consistently participating, staying on top of the course material, and trying your hardest.

Final grades will be calculated as follows:

15% Homework
50% Exams (16.33% each)
15% Final Paper
10% Final Poster
5% Daily check-ins (lowest 3 will be dropped)
5% Attendance and participation in group work

And letter grades will be assigned based on the usual grading scale (A = 93%+, A- = 90-92.9%, B+ = 88-89.9%, B = 83-87.9, etc.)

A NOTE ON THE "GENIUS MYTH": I've found that many Carls buy into the "genius myth" when it comes to math/stat courses: that you need to be a "math person" and have some innate mathematical ability in order to do well or become a major. **This could not be further from the truth!** The best statisticians don't necessarily have the "best" math or programming background, but are people that are able to formulate interesting questions and *use* math and programming to answer those questions. Many of the best statisticians I know became statisticians because they were initially interested in something else (biology, public health, psychology, neuroscience, physics, etc.) and realized that being able to answer important

questions with data was not only valuable but *fun* and *interesting*. Being able to perform interesting statistical analyses is a skill that is learned, not an innate ability, and working hard at developing that skill is the point of this course.

REGRADE REQUESTS: Grading is often a tedious task, and the grading team will sometimes make mistakes. I am always happy to fix these mistakes, and gradescope makes it easy to do so. Regrade requests must be submitted on gradescope within two weekdays after homework has been returned to you. Regrade requests are for administrative errors or obvious grading mistakes. I will not consider regrade requests for anything that applied to the entire class (e.g. "I think this mistake should only be worth 1 point instead of 2" or "I didn't realize we had to do X"). If you submit two or more inappropriate regrade requests, I will not consider additional regrade requests from you for the remainder of the term. If you're unsure whether you should file a regrade request or not, just ask! You are always welcome to discuss any grading questions with me in office hours.

ACADEMIC INTEGRITY

I encourage you to discuss the homework problems with others and use the resources available to you to try to figure out tough problems. You should code and write up your solutions on your own. Exams must be done by yourself without communicating with others; all work must be your own. The use of textbook solution manuals (physical or online), course materials from other students, or materials from previous versions of this course are not allowed. Large-language models (e.g. ChatGPT, Gemini, etc.) should only be used for coding help after you've attempted to solve the problem on your own, and you should never type homework problems directly into a prompt. Copying, paraphrasing, summarizing, or submitting work generated by anyone but yourself without proper attribution is considered academic dishonesty (this includes output from LLMs).

I also have a few rules in place to protect my intellectual property. You may not record my lectures using AI tools or upload any video or audio recordings to generate transcripts or study notes. You may not upload my course materials (slides, assignment prompts, note sets, etc.) into AI tools or homework help sites (such as chegg).

"AI" tools are new for all of us and it's OK to have questions about what is and isn't appropriate. Please ask if you are unsure of whether or not your actions are complying with the assignment/exam/project instructions. Always default to acknowledging any help received. Cases of suspected academic dishonesty are handled by the Provost's Office and I am obligated to report any suspected violations of this policy.

DIVERSITY AND INCLUSION

We all come to class with different backgrounds and experiences, and this diversity makes our class environment richer. I value diversity and inclusion, and am committed to a climate of mutual respect and full participation in and out of the classroom. This class strives to be a learning environment that is usable, equitable, inclusive and welcoming, regardless of race,

ethnicity, religion, gender and gender identities, sexual orientation, ability, socioeconomic background, and nationality. If you anticipate or experience any barriers to learning, please discuss your concerns with me.

RESOURCES

ACCOMMODATIONS: Carleton College is committed to providing equitable access to learning opportunities for all students. The Office of Accessibility Resources (Henry House, 107 Union Street) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations. If you have, or think you may have, a disability, please contact OAR@carleton.edu to arrange a confidential discussion regarding equitable access and reasonable accommodations. You are also welcome to contact me privately to discuss your academic needs. However, all disability-related accommodations must be arranged, in advance, through OAR.

STATS LAB: The Stats Lab (CMC 304) offers drop-in help R/RStudio help sessions run by friendly and knowledgeable lab assistants from 7-10pm Sunday through Thursday evenings. To make the most of your time, attempt homework problems on your own beforehand and bring your class notes and lab manual as these are helpful references for both you and the lab assistant.

TUTORS: If you find you need more support than office hours and the stats lab can provide, the Academic Support Center offers peer tutoring on the basis of referrals, requests, and availability of tutors. You can request tutoring through a form on their website, or discuss your needs with me and I can submit a referral.

TITLE IX: Please be aware that all faculty are "responsible employees", which means that if you tell me about a situation involving sexual harassment, sexual assault, dating violence, domestic violence, or stalking, I **must** share that information with the Title IX Coordinator. Although I have to make this notification, you will control how your case will be handled, including whether or not you wish to meet with the Title IX coordinator or pursue a formal complaint.

And finally….

Take care of yourself. Do your best to maintain a healthy lifestyle this term by wearing a mask when you're sick, eating a vegetable every now and then, exercising, avoiding excessive drug and alcohol use, getting enough sleep, and taking some time to relax. Your physical and mental health is more important than your grade in this course. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. For more information, see Student Health and Counseling (SHAC), the Office of Health Promotion, or the Office of the Chaplain. If you are experiencing physical or mental health symptoms as a result of coursework, please speak with me so we can address the problem together.